



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/812,157	03/19/2001	Eugene P. Marsh	150.00930102	2941

26813 7590 11/20/2002

MUETING, RAASCH & GEBHARDT, P.A.
P.O. BOX 581415
MINNEAPOLIS, MN 55458

EXAMINER

MALDONADO, JULIO J

ART UNIT	PAPER NUMBER
----------	--------------

2823

DATE MAILED: 11/20/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/812,157

Applicant(s)

MARSH, EUGENE P.

Examiner

Julio J. Maldonado

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 March 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 58-105 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 58-105 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. The non-final rejection as set forth in paper No.6 is withdrawn in response to applicants' amendments.

2. A new 103(a) rejection is made as set forth in this Office Action.

Claims 58-105 are pending in the application.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 58-80 and 83-105 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishioka et al. (U.S. 5,489,548) in view of Summerfelt (U.S. 6,117,689).

In reference to claims 58-61, 63-69, 71-74, 76, 78-80, 83-86, 88, 90-96 and 98-105, Nishioka et al. (Figs.1-14) in a related method to form high dielectric constant material electrodes teach the steps of providing a substrate assembly (30) including a surface; forming an electrode (42) on the at least one surface of the substrate assembly (30) comprising the steps of forming a patterned metal-containing adhesion layer (36) on the surface, resulting in at least one exposed surface region of the substrate assembly (30), said metal-containing adhesion layer (36) comprising titanium nitride and said surface region comprising silicon oxide; forming platinum on the patterned metal-containing adhesion layer (36) and the at least one exposed surface region of the

substrate assembly (30), said platinum having a thickness of 200 Å; annealing the substrate assembly (30) including the patterned metal-containing adhesion layer (36) at a temperature of 600°C; removing at least a portion of the platinum from the at least one exposed surface region of the substrate assembly (30) resulting in a patterned platinum layer (42) (column 2, line 26 – column 7, line 30).

Nishioka et al. fail to teach that the annealing process cause pooling of the platinum on the at least one exposed surface region of the substrate assembly. However, Summerfelt (Figs.7-13b) in a related method to form a high dielectric constant capacitor teaches a step of forming a single crystal platinum layer, wherein the process includes a step of forming an adhesion layer (64) on an exposed surface; depositing a layer platinum; and performing an annealing process causing pooling of the platinum on the at least one exposed surface region of a substrate assembly (30) (column 7, line 16 – column 10, line 42). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to form a platinum layer as taught by Summerfelt in the capacitor formation method of Nishioka et al., since this would nucleate the platinum layer only on areas where the adhesion layer is located, creating a single-crystal platinum layer, thus preventing oxygen diffusion (column 2, lines 59-63 and column 7, lines 16-29).

In reference to claims 62, 70, 77, 89 and 97, Nishioka et al. in combination with Summerfelt teach annealing the substrate assembling in an atmosphere of oxygen (Nishioka et al., column 6, lines 15-23) and applying rapid thermal anneal to the substrate assembly (Summerfelt, column 7, line 16 – column 10, line 42).

In reference to claims 75 and 87, the combined teachings of Nishioka et al. and Summerfelt substantially teach all aspects of the invention but fail to show the temperature is between about 650°C and about 1100°C. This claim is prima facie obvious without showing that the claimed range achieves unexpected results relative to the prior art range. In re Woodruff, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also In re Huang, 40 USPQ2d 1685, 1688 (Fed. Cir. 1996) (claimed ranges of a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). See also In re Boesch, 205 USPQ 215 (CCPA) (discovery of optimum value of result effective variable in known process is ordinarily within skill of art) and In re Aller, 105 USPQ 233 (CCPA 1955) (selection of optimum ranges within prior art general conditions is obvious).

5. Claims 81 and 82 rejected under 35 U.S.C. 103(a) as being unpatentable over Nishioka et al. ('548) in view of Summerfelt ('689) as applied to claims 58-80 and 83-105 above, and further in view of DeOrnellas et al. (U.S. 6,127,277).

Nishioka et al. in combination with Summerfelt substantially teach all aspects of the invention but fail to show removing unadhered platinum comprising rinsing the substrate assembly in a rinsing composition for a period of about 5 minutes or less, said rinsing composition comprising at least one composition selected from the group consisting of water, aqua regia, hydrochloric acid, hydrofluoric acid, hydrogen peroxide and combinations thereof. However, DeOrnellas et al. in a related method to etch semiconductor structures teach removing unadhered platinum comprising rinsing the

substrate assembly in a rinsing composition comprising at least one composition selected from the group consisting of water (column 5, lines 29-44). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the rinsing solution as taught by DeOrnellas et al. in the capacitor structure of Nishioka et al. and Summerfelt, since the rinsing solution can wash away water-soluble compounds (column 5, lines 29-44).

Still, Nishioka et al. in combination with Summerfelt and DeOrnellas et al. fail to teach performing the rinsing step for a period of time of about 5 minutes. The selection of the claimed range is obvious because it is a matter of determining optimum process condition by routine experimentation with a limited number of species. In re Jones, 162 USPQ 224 (CCPA 1955)(the selection of optimum ranges within prior art general conditions is obvious) and In re Boesch, 205 USPQ 215 (CCPA 1980)(discovery of optimum value of result effective variable in a known process is obvious).

Response to Arguments

6. Applicant's arguments with respect to claims 58, 66, 74, 83, 93 and 102 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Papers related to this application may be submitted directly to Art Unit 2823 by facsimile transmission. Papers should be faxed to Art Unit 2823 via the Art Unit 2823 Fax Center located in Crystal Plaza 4, room 3C23. The faxing of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2823 Fax Center number is **(703) 305-3432**. The Art Unit 2823 Fax Center is to be used only for papers related to Art Unit 2823 applications.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Julio J. Maldonado** at **(703) 306-0098** and between the hours of 8:00 AM to 4:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via julio.maldonado@uspto.gov. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri, can be reached on (703) 306-2794.

Any inquiry of a general nature or relating to the status of this application should be directed to the **Group 2800 Receptionist** at **(703) 308-0956**.

Application/Control Number: 09/812,157
Art Unit: 2823

Page 7

Julio J. Maldonado
Patent Examiner
Art Unit 2823
703-306-0098
julio.maldonado@uspto.gov


CHIEF EXAMINER
Patent Examiner
Technology Division